

Claims

We claim as deserving the protection of United States Letters Patent:

1. A composting system for facilitating a decomposition of organic material, the composting system comprising:

5 a digestion chamber with an input aperture for receiving organic material to be composted, a body portion, and an exhaust aperture for enabling an exhaust of composted organic material from the digestion chamber;

 an auger shaft rotatably retained relative to the digestion chamber;

 at least one mixing vane retained relative to the auger shaft for mixing organic
10 material within the digestion chamber; and

 a means for inducing a rotation of the auger shaft.

2. The composting system of claim 1 wherein the means for inducing a rotation of the auger shaft comprises a hydraulic power unit.

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3. The composting system of claim 2 wherein the means for inducing a rotation of the auger shaft further comprises a hydraulic auger motor wherein the hydraulic auger motor is hydraulically powered by the hydraulic power unit.

20 4. The composting system of claim 3 further comprising a hydraulic shredding unit with a hydraulic shredding motor for shredding organic material wherein the hydraulic

shredding motor is hydraulically powered by the hydraulic power unit.

5. The composting system of claim 4 further comprising a hydraulic input conveyor mechanism with a hydraulic input conveyor motor for conveying organic material from the
5 hydraulic shredding unit to the digestion chamber wherein the hydraulic input conveyor motor is hydraulically powered by the hydraulic power unit.

6. The composting system of claim 5 wherein the digestion chamber has an input end and an output end and wherein the hydraulic power unit, the hydraulic auger motor,
10 the hydraulic shredding unit, the hydraulic shredding motor, the hydraulic input conveyor mechanism, and the hydraulic input conveyor motor are disposed adjacent to the input end of the digestion chamber.

7. The composting system of claim 6 further comprising a control system for
15 controlling the operation of the hydraulic power unit, the hydraulic auger motor, the hydraulic shredding unit, the hydraulic shredding motor, the hydraulic input conveyor mechanism, and the hydraulic input conveyor motor.

8. The composting system of claim 1 wherein the digestion chamber is subdivided
20 into a plurality of subchambers by at least one divider wall wherein the auger shaft is disposed through each of the plurality of subchambers.

9. The composting system of claim 8 further comprising a temperature sensor operably associated with at least one of the subchambers and a heating element operably associated with the subchamber relative to which the temperature sensor is associated
5 whereby that subchamber can be maintained in a desired temperature condition.

10. The composting system of claim 8 wherein there are first and second divider walls that divide the digestion chamber into primary, secondary, and tertiary subchambers wherein the input aperture is in communication with the primary subchamber, wherein the
10 exhaust aperture is in communication with the tertiary subchamber, wherein a first intermediate aperture is disposed in the first divider wall for enabling a passage of organic material from the primary subchamber into the secondary subchamber, and wherein a second intermediate aperture is disposed in the second divider wall for enabling a passage of organic material from the secondary subchamber into the tertiary subchamber.

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11. The composting system of claim 10 wherein the input aperture, the first intermediate aperture, the second intermediate aperture, and the exhaust aperture sequentially decrease in effective height whereby organic material will tend to from the primary subchamber into the secondary subchamber, from the secondary subchamber into
20 the tertiary subchamber, and from the tertiary subchamber through the exhaust aperture in response to a rotation of the auger shaft and a concomitant rotation of the at least one

mixing vane.

12. The composting system of claim 8 wherein at least one mixing vane is retained relative to the auger shaft relative to each subchamber.

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13. The composting system of claim 12 wherein plural mixing vanes are retained relative to the auger shaft relative to each subchamber and wherein the plural mixing vanes retained relative to each subchamber have axial portions that cooperate to provide a substantially constant mixing surface immediately adjacent to an inner wall surface of the digestion chamber over an entire length of the respective subchamber.

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14. The composting system of claim 8 further comprising at least one vent associated with each of the subchambers for enabling an ingress or egress of gasses relative to the subchamber.

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15. The composting system of claim 14 further comprising a fan associated with each vent.

16. The composting system of claim 1 further comprising at least one malfunction sensor for sensing a malfunction of the composting system.

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17. The composting system of claim 16 wherein a malfunction sensor is operably associated with the auger shaft for sensing a malfunction of the auger shaft.

18. The composting system of claim 16 further comprising a shredding unit for shredding organic material wherein a malfunction sensor is operably associated with the shredding unit for sensing a malfunction of the shredding unit.

19. The composting system of claim 16 further comprising a means for communicating a malfunction report from the composting system to a remotely located receiver.

20. The composting system of claim 19 further comprising a means for determining a location of the composting system and wherein the malfunction report includes an indication of the location of the composting system.

21. The composting system of claim 19 wherein the means for communicating a malfunction report comprises a means for communicating a malfunction report to a remotely located receiver depending on a type of malfunction of the composting system.

22. The composting system of claim 1 further comprising a means for enabling an introduction of fluids into the digestion chamber whereby selected fluids can be introduced

into the digestion chamber to facilitate composting.

23. The composting system of claim 22 wherein the means for enabling an introduction of fluids into the digestion chamber comprises a supply source in fluidic communication with at least one supply aperture disposed along the auger shaft.

24. The composting system of claim 22 wherein the means for enabling an introduction of fluids into the digestion chamber comprises a supply source in fluidic communication with at least one supply aperture disposed along the at least one mixing vane.

25. The composting system of claim 1 wherein the means for inducing a rotation of the auger shaft comprises a power unit and further comprising a shell housing wherein the digestion chamber and the power unit are disposed in the shell housing.

26. The composting system of claim 25 further comprising a barrier wall disposed between the digestion chamber and the power unit.

27. The composting system of claim 1 further comprising a shredding unit for shredding organic material prior to a receipt of the organic material into the digestion chamber.

28. The composting system of claim 27 wherein the shredding unit comprises intermeshed, counter-rotating shredding shafts and further comprising a ferrous material separator for separating ferrous material from organic material.

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29. The composting system of claim 28 wherein the ferrous material separator comprises a rotatable magnetic drum in combination with a scraper for scraping the ferrous material from the rotatable magnetic drum.

10 30. The composting system of claim 28 wherein the shredding unit further comprises at least one feed arm for inducing organic material into contact with the shredding shafts for shredding.

15 31. A composting system facilitating a decomposition of organic material, the composting system comprising:

a shell housing with a first end, a second end, and an open inner volume;

a digestion chamber fixed within the open inner volume of the shell housing wherein the digestion chamber has an input end and an output end and wherein the digestion chamber is subdivided into a plurality of subchambers by at least one divider wall;

20 an input aperture disposed adjacent to the input end of the digestion chamber for receiving organic material to be composted

an exhaust aperture adjacent to the output end of the digestion chamber for enabling an exhaust of composted organic material from the digestion chamber;

an intermediate aperture disposed in the at least one divider wall for enabling a passage of organic material from subchamber to subchamber;

5 an auger shaft rotatably retained relative to the digestion chamber wherein the auger shaft traverses from adjacent to the input end of the digestion chamber to adjacent to the output end of the digestion chamber;

at least one mixing vane retained relative to the auger shaft relative to each subchamber of the digestion chamber for mixing organic material within the digestion
10 chamber;

means for inducing a rotation of the auger shaft;

a shredding unit retained relative to the shell housing for shredding organic material;

and

means for powering the shredding unit.

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32. The composting system of claim 31 wherein the shredding unit, the means for inducing a rotation of the auger shaft, and the means for powering the shredding unit are disposed adjacent to the input end of the digestion chamber and further comprising a barrier wall disposed within the shell housing wherein the shredding unit, the means for
20 inducing a rotation of the auger shaft, and the means for powering the shredding unit are disposed to a first side of the barrier wall and wherein the digestion chamber is disposed to

a second side of the barrier wall.

33. The composting system of claim 32 wherein the means for inducing a rotation of the auger shaft and the means for powering the shredding unit comprise a single power
5 unit.

34. The composting system of claim 33 wherein the single power unit comprises a hydraulic power unit.

10 35. The composting system of claim 34 further comprising a hydraulic input conveyor mechanism with a hydraulic input conveyor motor for conveying organic material from the hydraulic shredding unit to the digestion chamber wherein the hydraulic input conveyor motor is hydraulically powered by the hydraulic power unit.

15 36. The composting system of claim 31 further comprising at least one vent associated with each of the subchambers for enabling an ingress or egress of gasses relative to the subchamber.

20 37. The composting system of claim 31 further comprising at least one malfunction sensor for sensing a malfunction of the composting system.

38. The composting system of claim 37 further comprising a means for communicating a malfunction report from the composting system to a remotely located receiver.

5 39. The composting system of claim 38 further comprising a means for determining a location of the composting system and wherein the malfunction report includes an indication of the location of the composting system.

10 40. The composting system of claim 39 wherein the means for communicating a malfunction report comprises a means for communicating a malfunction report to a remotely located receiver depending on a type of malfunction of the composting system.

15 41. The composting system of claim 31 further comprising a means for enabling an introduction of fluids into the digestion chamber whereby selected fluids can be introduced into the digestion chamber to facilitate composting.

20 42. The composting system of claim 41 wherein the means for enabling an introduction of fluids into the digestion chamber comprises a supply source in fluidic communication with at least one supply aperture disposed along the auger shaft.

43. The composting system of claim 41 wherein the means for enabling an

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introduction of fluids into the digestion chamber comprises a supply source in fluidic communication with at least one supply aperture disposed along at least one mixing vane.